



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Notes on Californian Species of Delphinium

BY ALICE EASTWOOD

I. DELPHINIUM DECORUM F. & M. AND ITS ALLIES

The Californian species of *Delphinium*, like those of many other Californian genera, are but little understood. This is owing to the remarkable tendency to variation, to the confusion in regard to the types, and to the generally inadequate material in herbaria.

Delphinium decorum F. & M. is one of the most puzzling species, under which plants quite different in appearance have been included. The species was originally described by Fischer and Meyer (Ind. Sem. Petr. 3: 33. 1836), and the description was transcribed into the supplement of Linnaea (Linnaea 12: Suppl. 92). As seen in this description, given in the footnote, the type locality is Bodega Port.*

To rediscover this and some other plants described from the same place, the writer visited this port twice in the spring and summer of 1899. Only one species of *Delphinium* was found around the port. This grew on the ocean side of the promontory which rises about a hundred feet from the sea. The native vegetation of the promontory has been preserved from destruction by a fence which has been built around it to keep the cattle from the danger of being carried down to the surf below on some of the land slides which frequently occur during the wet season. From the specimens collected there the following description has been made :

* *Delphinium* (*Delphinastrum* ; *Coh. grumosa* : Petalorum lamina dilatata, bifida : petioli basi vix dilatati : radix tuberosa-grumosa. Huc *D. Menziesii*, *D. elegans*, *D. tricornis*) *decorum* Fisch. et Mey. *D.* pubescens, subglabrum : foliis tripartitis : segmentis lateralibus bifidis indivisive : lobis oblongis tridentatis l. integerrimis : floralibus bracteisque suboblongis (plerumque) integris : calcar. curvulo sepalorum longitudine. —*D. Menziesii* et *D. eleganti* proximum, sed foliis bene distinctum. Flores, speciosi, primo ex coeruleo violascentes, dein violaceo-purpurascentes.—Hab. circa coloniam Ruthenorum Ross in portu Bodega Novae Californiae.

DELPHINIUM DECORUM F. & M.

Roots fibrous from a single roundish or irregularly lobed tuber, about 1 cm. below the true stem. Stems one to several from the root, 1-2 dm. high, diffusely branched from the base or simple, striate, somewhat glabrous or pubescent with short white deflexed curly hairs. Radical leaves on petioles 3-12 cm. long, broadening at base and sheathing the stem: blades with from 3-5 main divisions, these cuneate, separated, 1-3 cm. long, 5-15 mm. broad, 2-3-lobed with rounded, mucronate lobes: pubescence of lower surface similar to that of the stem, upper surface almost glabrous: cauline leaves, if present, with narrower divisions, generally simple and entire. Inflorescence corymbose: lowest bracts with usually simple, entire, oblong divisions on short petioles: upper bracts and bractlets spatulate, entire, 5-10 cm. long, 2-8 mm. broad: pedicels stout, erect or upwardly spreading, often becoming 6 cm. long, with 2 or 3 alternate or, rarely 2 opposite bractlets. Flowers 25 mm. in diameter, purplish blue. Sepals pubescent externally, especially along the median line, with a greenish spot near the top, oblong or oval, obtuse or acute, 10-15 mm. long, 5-10 mm. wide: spur thick, 10 mm. long, straight or curved on the same plant. Lower petals with orbicular, 2-lobed blade and a claw equally long, spurred at base, covered with long white hairs except on a spot above the claw which is clothed with long yellow hairs: upper petals white, tinged or veined with blue, notched at apex, glabrous. Follicles diverging from the first, glabrous or slightly pubescent when ripe, 15 mm. long, including the persistent styles. Seeds brown when ripe, the loose cellular outer coat of the young seed forming a close, tuberculate covering to the ripe seed.

Specimens are represented in the Herbarium of the Academy by no. 801 from Coburn's Mills, collected by T. S. Brandegee, May 29, 1891, and by a specimen collected by the author at Kaweah, Tulare county, May, 1894, no. 789. With this is another specimen similar in all respects except the pubescence, it being glabrous where the other is glandular-hairy. This leads me to think that the character of the pubescence is not to be relied on as a characteristic and that all of these are but forms of the same species modified by environment which cultivation under similar conditions might prove to be identical. If this glandular form should not prove to be a distinct species, it nevertheless deserves varietal rank.

The type descriptions are appended in the footnotes for the benefit of those to whom the original references are not accessible.

II. NEW SPECIES OF DELPHINIUM

***Delphinium polycladon* sp. nov.**

Stems 8 dm. tall with many spreading, slender, rather weak branches. Lower part of plant glabrous, pubescence scanty on the leaves, denser on the upper stems and pedicels, close on the follicles. Leaves mostly near the base, orbicular in outline, 6 cm. across, with 3-5 broad, cuneate divisions having short, acuminate lobes: petioles long and slender, often more than 10 cm., dilated at the clasping base. Inflorescence paniculate, pedicels erect, 2-4 cm. long, bracts narrowly subulate, bractlets filiform near the flower. Flowers small, about 2 cm. across, bluish purple. Sepals obovate, obtuse, spur 8 mm. long, usually curved at tip. Upper petals white veined with blue, lower petals oblong, deeply emarginate, with a prominent spur on the claw and a yellowish, very hairy spot at the base of the blade. Follicles with thin walls through which the outlines of the large seeds are plainly visible, becoming almost moniliform when the seeds are ripe, spreading but little. Ripe seeds brown, angled, rugose, almost 2 mm. in diameter.

This interesting *Delphinium* was collected by the writer near the forks of Bubbs Creek in Fresno county, California. It grew in a thicket where the ground was springy. It was impossible with the tools at my command and the time at my disposal to dig up the roots. It was collected July 9, 1899.

***Delphinium pratense* sp. nov.**

Root grumous, small and near the surface. Stems slender, simple or branched from the base, about 3 dm. high. Pubescence villous with soft, white, deflexed-spreading hairs, usually densest on the lower stem and inflorescence. Radical and lower cauline leaves about 3 cm. broad, with 3-4 cuneate divisions each with linear-oblong mucronate lobes: petioles 3-6 cm. long, broadening at base and sheathing the stem: cauline leaves, except the lowest, really bracts subtending the lowest pedicels, with simple, linear, entire divisions or lobed. Flowers at first scattered on long pedicels, later forming a loosely or closely flowered raceme which is simple or compound: lower pedicels 5 cm. long, upper 1.5 cm.: upper bracts becoming simple and linear, about half as long as the pedicels: bractlets opposite or alternate, on the upper part of the pedicel, narrowly linear. Flowers purple and white, small, 15 mm. across, the spur straight, horizontal, 1 cm. long, very

slender, often bidentate at tip. Lower sepals almost equalling the spur, obovate, acute, the upper broader and with a conspicuous saccate spot near the apex. Lower petals bifid and erose, pubescent, white with a purple blotch near the base of the blade, with the broad claw shorter than the blade and with a spur at base: upper petals triangular-ovate, 2-lobed at apex, white, margin undulate. Follicles pubescent, slightly spreading. Seeds with a close, brown, minutely rugose coat, with a membranous crown at summit.

This grows in the high meadows of the Sierra Nevada. The specimens were collected in Horse Corral Meadow on the trail to the Kings River Cañon, July 9, 1899 (by the writer).

***Delphinium subnudum* sp. nov.**

Roots of fleshy, fascicled tubers, near the surface. Stems simple, erect, slender, 2–3 dm. high, pubescent with fine, white, soft, spreading, deflexed hairs. Radical leaves broadly ovate in outline, 2–5 cm. broad at base and of equal length: main divisions 3, each twice dissected, the ultimate divisions linear-spatulate, mucronate: petioles broad and sheathing at base, ribbed: cauline leaves 2 or 3, very small and inconspicuous, the palmately divided blade in most only as broad as the sheathing base of the petiole. Raceme few-flowered: bractlets generally opposite and close under the flower: pedicels slender, erect or somewhat tortuous. Flowers rather large, purplish blue. Sepals somewhat pubescent externally, oval, generally mucronate, 18 mm. long, 12 mm. broad, upper one orbicular, 14 mm. broad: spur straight or recurved at tip, as long as the calyx. Upper petals entire, crenate, or notched, white or bluish: lower petals with orbicular, notched blade, claw with a conspicuous spur near the base. Follicles pubescent, somewhat spreading: style tipped with 2-toothed stigmas. Seeds covered with a loose, white membranous, veiny coat.

This was collected by the writer in Squaw Valley, Fresno county, California, May 4, 1895. It grew in a low spot where water had stood and was distributed over a limited area. I have also included in this species a specimen from Applegate, Placer county, California, collected by Mrs. Helen Smith, May, 1899.

In the specimen from Fresno county the spur is almost straight, in the Placer county specimen the spur is abruptly bent at the tip. This does not seem to be a character of any importance, for in other species the spur is often both straight and curved in the same plant. The follicles and seeds were described

from the Placer county plant, that from Fresno county being too young. A search over the entire area covered by the plants failed to discover a single fruiting specimen.

Besides the specimens collected at Bodega Port (no. 770),* there is another typical specimen in the Herbarium of the California Academy of Sciences. This is one collected by Dr. Kellogg, at San Gregorio, in San Mateo county, May 14, 1870 (no. 771).

DELPHINIUM DECORUM **racemosum** var. nov.

This is the form common in the vicinity of San Francisco. It is distinguished by racemose inflorescence, simpler, more glabrose, taller stems, narrower bracts and bractlets, the latter generally opposite and close under the flower, spurs generally straight. The flowers vary somewhat in size and generally are smaller than those of the typical form. This is probably the *D. Mensiesii* of the Manual of the Bay Region: *D. decorum* of that work being more like *D. patens* Benth. (Pl. Hartweg. 296). Specimens of this variety are represented in the Herbarium of the Academy from Sausalito (no. 765), and Mt. Tamalpais (no. 766), in Marin county, from Colma (no. 767) and Crystal Springs (no. 763), San Mateo county, and from Mission Hills, Stanford Heights (no. 769), and Bay View Hills (no. 762), San Francisco.

DELPHINIUM DECORUM **Sonomensis** var. nov.

Similar in habit to the preceding variety, but with denser pubescence, more evidently canescent; leaves with narrower, more dissected divisions; flowers with narrower sepals and stouter spurs. This form was collected by the writer at Altruria, Sonoma county, April 7, 1900. (No. 764.)

There are some other specimens in the herbarium of the Academy, which appear to belong under *D. decorum* but the material is too imperfect, as the roots and fruits are wanting, and it is better to leave them unnamed and undescribed than to add to the already existing confusion.

At present the small-flowered species of *Delphinium* which has been named *D. decorum* F. & M. in the "Manual of the

* These numbers are the herbarium numbers of the specimens.

Botany of the Region of San Francisco Bay," seems to be without a name. Professor Greene suggests, in a letter recently received, that it is what he named *D. apiculatum*, Pittonia, I. 285. This can scarcely be the case for the character of the root is quite different. According to his description, the root is similar to that of *D. recurvatum* which he describes on the same page as having a fascicle of fleshy-fibrous thick roots. *D. apiculatum* must be, as he himself there suggests, a near relative of *D. variegatum* T. & G. of which he subsequently made it a variety. (Fl. Francis. 304.)

D. decorum is more like *D. patens* Benth. (Pl. Hartweg, 296.) It is not clear to the writer what difference there is between *D. patens* and *D. gracilentum* Greene. (Pittonia, 3: 15.)* Until the types are better known and the differences between these species clearly defined it seems best to consider these two species as the same, under the oldest name, recognizing the fact that they do not exactly agree with the original description of *D. patens* which is given in the footnote† nor, in all particulars, with each other.

Specimens have been examined from the following localities represented by specimens in the Herbarium of the California Academy of Sciences :

Santa Inez Mountains, T. S. Brandege (no. 915).

El Dorado, Katherine Curran (no. 914).

* DELPHINIUM GRACILENTUM. Slender, usually 2 feet high or more, from a grumous-tuberiform root, sparsely leafy, pale green and glaucescent, appearing glabrous, a lens revealing short stiff white hairs at the base of the stem, and again upon the small bracts of the inflorescence : radical leaves few, long-peduncled, 2 or 3 inches broad, deeply about 5-parted, the lobes mostly oval or oblong, obtuse and entire ; lower cauline more cuneately cleft, and the segments 3-lobed : racemes long, slender and lax : flowers small, deep blue (pink in the frequent albino state), the stoutish slightly curved spur little exceeding the oblong sepals : follicles slightly divergent

Middle elevations of the Sierra Nevada, California. It is the *D. patens* of my Flora Franciscana, and I formerly supposed it to be the plant which Benthams so named ; but having seen the specimens on which *D. patens* was founded, I am certain that that is only *D. decorum* : not even a variety of that species. In the "*D. patens*" of my Flora I included a plant which is of a "deeper green, and glandular pubescent." This, I think, will prove to be another distinct species of the Sierra Nevada, though I am not yet able to assign characters enough to warrant its publication. Its root is still unknown to me. Pittonia, 3: 15. Greene.

† "Delphinium *patens*, sp. n., glabrum v. puberulum, ramosum, petiolis basi dilatatis, foliis profunde 3-5 lobis, lobis inferiorum obovatis obtusis subtrilobis superiorum subintegris angustis, racemis laxis, petalis sepalis brevioribus, inferioribus bifidis barbatis, ungue glabriuscula ecalcarato, calcare curvulo sepalis aequilongo.—Flores iis D. azurei similes sed racemi laxi pedicellis patentibus, et folia multo minus dissecta, lobis latis obtusis.—In valle Sacramento." Pl. Hartweg. 2962. Benth.

- Cucumongo Mountains, S. B. Parish, no 1718 (no. 912).
 Los Gatos, T. S. Brandegee (no. 911).
 Mokelumne Hill, Dr. F. E. Blaisdell (no. 909).
 Calistoga, Alice Eastwood (no. 907).
 Antioch, Katherine Curran (no. 906).
 Saucelito, Alice Eastwood (no. 905).
 Monterey, Alice Eastwood (no. 908).
 Armstrong's Station, Eldorado county, Geo. Hansen, no. 1114 (no. 792).
 Stony Creek, Amador county, Geo. Hansen, no. 1606 (no. 913).
 Soda Creek, Tulare county, C. A. Purpus, 1848 (no. 791) and (no. 790).
 Silver Lake, Amador county, Geo. Hansen, no. 897 (no. 788).
 Volcano, Amador county, T. S. Brandegee (no. 786.)
 Forest Ranch, Butte county, Mrs. C. C. Bruce, 1914 (no. 787).
 Modoc county, Mrs. R. M. Austin (no. 916).

These can be characterized as follows: Roots grumous, pubescence little or none, leaves mostly from the base of the stem on rather long petioles, with broad, cuneate, lobed divisions, generally spreading apart: loose open racemes with small flowers on slender, upwardly spreading pedicels: follicles generally glabrous, widely spreading. In Bentham's description, the claw of the lower petal is said to be "glabriuscula ecalcarato." This is the case with the following specimens only, the numbers used to designate them being the herbarium numbers which are in parenthesis. 790, 791, 908, 906 (this is most like the type according to the description), 907, 909 (spur slightly evident), 911, 912 (spur scarcely evident).

The glandular species of the southern Sierra Nevada which Professor Greene alludes to in his description of *D. gracilentum* seems to me also as deserving of specific rank. It is very closely allied to those specimens included under *D. decorum* in the above general description, but differs in some marked particulars. It is as well to name and describe it, as to point out its characters without a formal description, therefore I name it for him who first detected its specific character.

Delphinium Greenei sp. nov.

Many slender fibers from a grumous root, a short distance below the surface of the ground. Stems 3–5 dm. high, generally reddish and glandular pubescent above, inclined to be glabrous below, generally simple. Leaves similar to those of *D. decorum*, the divisions always mucronate at the rounded apex and the sinus between the broad divisions obtuse. Racemes less open, the pedicels shorter and the flowers smaller, frequently dull rose color rather than violet blue. The inflorescence is more distichous and is glandular-hairy on peduncles and pedicels. Sepals surpassing the petals, shorter than the spur, this curved upwards in the bud, generally straight on the open flower, lower petals with blade lobed almost to the base, clothed with long hairs and having a rather broad claw as long as the blade and distinctly spurred near the base; upper petals also lobed, undulate along the upper margin. The immature follicles are glandular-hairy and spreading.